1. Determine whether the function below is 1-1.

$$f(x) = -24x^2 + 4x + 580$$

A. No, because there is a y-value that goes to 2 different x-values.

B. No, because there is an x-value that goes to 2 different y-values.

C. Yes, the function is 1-1.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because the domain of the function is not $(-\infty, \infty)$.

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2. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = e^{x-4} - 2$$

A. $f^{-1}(7) \in [-1.91, -1.76]$

B. $f^{-1}(7) \in [-0.95, -0.87]$

C. $f^{-1}(7) \in [-0.02, 0.51]$

D. $f^{-1}(7) \in [-0.52, -0.32]$

E. $f^{-1}(7) \in [5.63, 6.64]$

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3. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 2x^2 + 7x + 8 \text{ and } g(x) = \sqrt{4x - 17}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [3.25, 7.25]$

B. The domain is all Real numbers except $x = a$, where $a \in [-5.75, -1.75]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-1.5, 9.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [3.6, 10.6]$ and $b \in [-0.6, 7.4]$

E. The domain is all Real numbers.

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4. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -15$ and choose the interval that $f^-1(-15)$ belongs to.

$$f(x) = \sqrt[3]{3x - 2}$$

A. $f^{-1}(-15) \in [1122.93, 1124.98]$

B. $f^{-1}(-15) \in [-1126.09, -1125.21]$

C. $f^{-1}(-15) \in [-1124.91, -1123.2]$

D. $f^{-1}(-15) \in [1124.54, 1127.79]$

E. The function is not invertible for all Real numbers.

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5. Find the inverse of the function below. Then, evaluate the inverse at $x = 6$ and choose the interval that $f^-1(6)$ belongs to.

$$f(x) = e^{x+4} + 2$$

A. $f^{-1}(6) \in [4.15, 5.18]$

B. $f^{-1}(6) \in [3.83, 4.12]$

C. $f^{-1}(6) \in [5.31, 5.63]$

D. $f^{-1}(6) \in [2.13, 2.72]$

E. $f^{-1}(6) \in [-2.81, -2.57]$

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6. Determine whether the function below is 1-1.

$$f(x) = (6x - 35)^3$$

A. Yes, the function is 1-1.

B. No, because there is an x-value that goes to 2 different y-values.

C. No, because there is a y-value that goes to 2 different x-values.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because the domain of the function is not $(-\infty, \infty)$.

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7. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -13$ and choose the interval that $f^-1(-13)$ belongs to.

$$f(x) = \sqrt[3]{3x - 4}$$

A. $f^{-1}(-13) \in [-731.4, -729]$

B. $f^{-1}(-13) \in [729.1, 731.8]$

C. $f^{-1}(-13) \in [-735.7, -733.5]$

D. $f^{-1}(-13) \in [731.6, 734.4]$

E. The function is not invertible for all Real numbers.

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8. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \sqrt{5x + 21} \text{ and } g(x) = 8x + 8$$

A. The domain is all Real numbers except $x = a$, where $a \in [-4.25, -2.25]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-10.2, -3.2]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.5, -2.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-7.75, -0.75]$ and $b \in [0.25, 8.25]$

E. The domain is all Real numbers.

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9. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -x^3 - 2x^2 - 4x \text{ and } g(x) = x^3 - 1x^2 - 4x$$

A. $(f \circ g)(-1) \in [-6, 3]$

B. $(f \circ g)(-1) \in [3, 14]$

C. $(f \circ g)(-1) \in [-21, -16]$

D. $(f \circ g)(-1) \in [-30, -23]$

E. It is not possible to compose the two functions.

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10. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -x^3 + 3x^2 + 4x - 3 \text{ and } g(x) = 3x^3 + 4x^2 - 2x - 4$$

A. $(f \circ g)(-1) \in [-39, -33]$

B. $(f \circ g)(-1) \in [4, 7]$

C. $(f \circ g)(-1) \in [-44, -41]$

D. $(f \circ g)(-1) \in [-3, 0]$

E. It is not possible to compose the two functions.
